1. **BACKGROUND AND PURPOSE**

Rural livelihoods in West Africa are mainly agro-based. The major components of the livelihood means are crops and livestock production, processing and marketing. Farmers produce cereals, legumes, vegetables and fruit crops; and keep livestock. However, optimal system productivity is limited by cocktail of constraints which include socioeconomic, biophysical, institutional and financial.

The traditional farming practices of farmers in northern Ghana without improved interventions has often resulted in environmental degradation, poverty, food insecurity and malnutrition especially among the vulnerable. In Ghana for example, seasonal cycles of food insecurity of 3-5, 4-5, and 6-7 months for maize (*Zea mays)*, sorghum (*Sorghum bicolor*) and pearl millet (*Pennisetum americanum)*, and 5-7, 4-5 and 6-7 months for cowpea (*Vegan unguiculata*), groundnut (*Arachis hypogaea* L.) and soybean (*Glycine max*) are recorded in the Northern, Upper West and Upper East regions, respectively (Quaye 2008). Main staple crops include sorghum, millet, cowpea, groundnut, bambara groundnut (*Vigna subterranea* [L.] Verdc.), yam (*Dioscorea spp*), cassava (*Manihot esculenta*) and sweet potato. Maize is the most important cereal crop grown by a majority of farmers in all parts of the country. Currently, maize-based cropping systems have become dominant in drier parts of northern Ghana where sorghum and millet were the traditional food security crops. According to SRID (2010), maize is the most cultivated crop (991,669 ha) on arable land compared with 181,228 ha for rice (*Oryza sativa*), millet (176,000 ha), sorghum (252,555 ha), cassava (875,013 ha), and yam (384,942 ha).

In the recent past, development in rural communities entails government agents instructing farmers what to do to improve agricultural production and food security. The process resulted in partial technology adoption or adaptation. The evolution of the research and extension process has increased the involvement of farmers in the research and extension agenda by adopting the Participatory Research and Extension Approach (PREA). Participatory research seeks to involve farmers in the process at all stages in the definition of the research agenda, conduct of research, evaluation of results and dissemination of the findings. The objectives of the PREA approach are: to facilitate local farmers in their identification of problems and the search for solutions; build strong linkages between local communities, extension agents and researchers and the private sectors working as partners; and encourage transfer of new and appropriate technologies from farmer to farmer. The approach comprises four stages: situation analysis and social mobilization, action planning; farmer experimentation; and sharing experiences (Ellis-Jones *et al*., 2005).

The Africa Rising – Ghana Project is a Feed the Future support from the United States Agency for International Development (USAID) and coordinated by the International Institute of Tropical Agriculture (IITA), Ibadan. The research for development (R4D) Project targets ‘sustainable intensification of cereal-based farming system in the sudano-sahelian zone of Ghana’. The Project aims to provide pathways out of hunger and poverty for small holder families, particularly for women and children, through sustainably intensified farming systems with special focus on maize/legume farming system. The specific objectives are to: identify demand driven sustainable intensification options that are socially acceptable, economically feasible, and environmentally sound; combine and adapt these options to address constraints and exploit opportunities; evaluate the effectiveness of the options; and strengthen capacity of partner research and development institutions, farmers, community-based organizations, and non-governmental organizations; among others.

The Project is being implemented in four districts in each of three regions in northern Ghana (Northern, Upper East and Upper West Region) with five communities per district, bringing the total to 60 participating communities. An innovation platform of diverse stakeholder institutions have been put in place for implementation of the project activities. This comprises the Ministry of Food and Agriculture (MoFA), CSIR-Savanna Agricultural Research Institute (CSIR-SARI), agro-input and output dealers, farmers, community-based organizations and policy makers. The direct beneficiaries of the project output are farmers, community-based organizations (CBOs), agro-input and output dealers, research and extension staff in both public and private sector and the public in general.

Situation or community analysis is the first among four key stages of the Participatory Research and Extension Approach. The community analysis entails encouraging and mobilizing the communities to undertake their own situation analysis and think of how they can deal with their own problems. The major objectives of the community analysis were to:

* share knowledge and information about the livelihood situation in the communities in relation to legumes/cereals/livestock production/processing/marketing,
* identify priority problems and opportunities for improved livelihoods in the communities,
* assess with the community members the existing technology options, and
* identify entry points for members within the innovative platforms for project implementation in the respective communities,
* identify CBOs and select lead farmers and community seed producers at the community level.

Consequently, the project management recruited a team of consultants to facilitate the conduct of the community analysis in three regions in northern Ghana. This report summarizes the salient findings made during the community analysis of the Africa Rising Project in Ghana.

**2.0 METHODOLOGY**

The task was accomplished through the conduct of stakeholder training workshop on community analysis tools; and the conduct of actual field work in the 60 communities using a field survey and community entry approaches between 9th and 21st May 2012.

**2.1 Community Analysis Training Workshop**

The training workshop was conducted on 9th and 10th May 2012. A total of 32 participants drawn from MoFA, CSIR-SARI, University for Development Studies (UDS), IITA, Village Vision Images (VVI) and CSLD took part in the training exercise. The three Regions were well represented during the workshop.

The principles and practices of PREA were discussed to increase awareness and understand its modus operandi vis-à-vis project implementation. Participants were taken through each activity enshrined in the four stages of the approach. A large number of participatory tools are available for community analysis depending on the situation. Six tools were selected and participants were trained on their use for the conduct of the study in the project area. The community analysis tools used included livelihood analysis, problem ranking, resource mapping, institutional and market analyses and seasonal calendar.

Participants were trained on how to collect general information (population structure-men and women, settlement pattern, ethnic composition, vegetation, soil type, agro-ecology, community hierarchy, location and distance from Regional and District headquarters). Participants were trained on good facilitation principles by building trust and respect for community norms and values, facilitation and not teaching during the process, letting farmers speak, control dominators, ensure that the quietest are also involved and mainstream gender and the vulnerable. Participants were divided into two groups and each group simulated practical demonstration on how community analysis is conducted using the tools.

**2.2 Planning for field work**: Six teams were composed with two teams per each of the three regions: Northern, Upper East and Upper West. Each team was assigned 10 communities to facilitate per region, thus making a total of 60 communities. Each team was supplied with checklist of information required and copies of community analysis tools, vehicles, stationary and field agenda.

**2.3 Field work and process of tools application**: The study commenced concurrently using a field survey and community entry approaches in Northern, Upper East and Upper West Regions of Ghana starting from 14th May to 21st May 2012. A team of facilitators including agricultural extension officers (AEAs) and researchers facilitated the communities during the meetings to identify possible intervention strategies in the livelihood systems and to plan together for follow-up actions. Half a day was set aside for the community entry as agreed with the community members. Time spent at each meeting was about 4-5 hours. After exchanging greetings with the elders, the project team briefed the community members of the team’s mission. The community members were then facilitated to identify their natural resources, livelihood systems, discuss the problems and coping strategies and rank them where appropriate. The groups in each community split into three subgroups after the general introduction to collect data on men, women and youth livelihood means as described by Hagmann *et al*. (1999) and Ellis-Jones *et al*. (2005). The participants provided data on the following:

* + 1. *Livelihood Analysis:* participants brainstormed and identified major means of deriving livelihood at the community level. Estimates were made of the extent of number or percentage of people involved in the production, processing and marketing of crop and livestock enterprises, their relative importance for food and cash, trends and reasons for such were also elicited.
    2. *Crop and livestock priority ranking*: participants listed the major crops and livestock species produced in the community. These were ranked using pair-wise ranking and the status of each enterprise produced in the community was thus established.
    3. *Problem analysis*: participants were facilitated to list their major problems related to production, processing and marketing of cereals, legumes and livestock. These were prioritized and ranked using pair-wise ranking.
    4. *Coping strategies:* participants articulated their coping strategies and adaptation to the priority problems ranked; the method used, when known, from whom, advantages and disadvantages, percentage involved in the community, trends and reasons
    5. *Resource analysis*: existing environmental resources were assessed for opportunities with respect to production, processing and marketing of cereals/legumes/livestock. The community resources were identified and placed in the community map drawn on the ground by the participants. These were later transferred to a community map on paper which was further confirmed by the participants.
    6. *Institutional Analysis*:participants were assisted to identify both formal and informal institutions within and outside the community, including CBOs; membership and linkages. The CBOs identified were further analyzed to determine their strengths, weaknesses, opportunities and threats (SWOT). The strong CBOs later selected lead farmers and seed producers that were to participate in the project activities
    7. *Market Analysis*: farmers were assisted to establish the flow of agro-inputs and outputs into and out of the community (market network mapping); establish market infrastructure that facilitated the performance of market functions; and market channels of wholesalers, middlemen, retailers and farmers or producers through whom the commodities passed before reaching the final consumer. The analyses also included the identification of market opportunities existing forinput service providers and constraints to marketing of cereals, legumes and livestock.
    8. *Seasonal calendar of household activities*: participants identified major farm and non-farm activities performed at household levels all year round; their peak and low periods.

Each of the six groups presented the findings at plenary during a wrap up meeting on 22nd May 2012. These findings assisted in the articulation of community action plan for project implementation.

**3.0** **RESULTS OF COMMUNITY ANALYSIS IN NORTHERN REGION**

**3.1 Biophysical Characteristics and Agro-environment**

The Northern Region, which occupies an area of about 70,383 km2, is the largest region in Ghana in terms of land area. It shares boundaries with the Upper East and the Upper West regions to the north, the Brong Ahafo and the Volta regions to the south. Northern region shares borders on the east with the republic of Togo and to the west with Cote d’Ivoire. The land is mostly low lying except in the north-eastern corner with the Gambaga escarpment and along the western corridor. The region is drained by the Black and White Volta and their tributaries, rivers Nasia, Daka, etc.

The project communities in the northern region are clustered settlements (Annexes 1a and 1b). The populations range from 180 in the most sparsely populated Frafra No.4 community to 3850 in Zungu, the most densely populated. Other densely populated communities are Damongo Zongo, Busunu, Tigoli and Kanshegu. Among the Mole-Dagbon ethnic group, the largest sub-groups are the Dagombas and Mamprusis, while Komkombas are the largest of the Gurma; the Chokosis are the largest of the Akan ethnic group while the Gonjas are the largest of the Guan group. Dagombas constitute about a third of the population of the region. Other prominent ethnic groups include Gonja, Fulani, Ewe, Frafra, Dagarti, Sissala, Waala, Akan and Grunsi. In the Dagomba community, the chief is the community head, while the assembly man, Kpalana and/Wulana, religious and youth leader, respectively, are next in leadership hierarchy in that order.

The climate of the region is relatively dry, with a single rainy season that begins in May and ends in October. The amount of rainfall recorded annually varies between 1000 and 1200 mm. The dry season starts in November and ends in March/April with maximum temperatures occurring towards the end of the dry season (March-April) and minimum temperatures in December and January. The harmattan winds, which occur during the months of December to early February, have considerable effect on the temperatures in the region, which may vary between 14°C at night and 40°C during the day. During the harmattan period, the humidity, is quite low and this mitigates the effect of the daytime heat. A vast area of the region is still under populated and under cultivated.

The agro-ecology is northern Guinea savanna with vegetation ranging from semi-deciduous clustered trees in West Gonja district to scattered trees and shrubs in Yendi Municipality. The soils are gravelly sand in Savelugu/Nanton and sandy loam in the other 3 districts (Annexes 1a and 1b). The main vegetation is largely grassland, Common trees in the zone consist of drought and fire resistant trees such as baobab (*Adonsonia digitata*), West African locust bean commonly called dawadawa (*Parkia biglobosa)*, shea tree (*Vitellaria paradoxa*), Neem (*Azadirachta indica*) and Acacia [*Faidherbia albida* (Del.)]. The greatest influence on the vegetation is the prolonged dry season. During this period, the grass becomes dry and the subsequent bush burning leaves the area patched and mostly bare landscape Shea nuts and charcoal are collected from the wild and constitute some of the common/access resources that enhance livelihoods in the region.

**3.2 Existing Farming Systems and Problem Analysis**

**3.2.1 Analysis of on-farm livelihood activities in northern Region:** Analysis of on-farm activities in the four districts in the northern region revealed that all men, women and youths in most communities are engaged in crop and livestock production as means of livelihood (Annexes 2a-d). The cereals are predominantly produced by men, while women are mainly involved in production of legumes and youths produce both cereals and legumes (Annexes 2a and 2b). Maize and sorghum are the major staple food crops followed by millet and rice. However, rice is also grown for cash. Legumes such as groundnut, soybean and cowpea are mainly grown for cash although 10-40% of groundnut, soybean and cowpea are also devoted to food. The trend in production of maize is increasing probably because the crop is the major staple food crop in the region. However, maize production is decreasing in Jonokponto in West Gonja district and Zang in Yendi municipality due to declining soil fertility. Sorghum production is either static or decreasing due to many constraints including erratic rainfall, declining soil fertility, lack of interest from the farmers and low intercrop compatibility with legumes. Although rice production is increasing especially in the Savelugu/Nanton district because it is a source of income and yields are improving, the trend is either static or decreasing in the West Gonja district due to low interest, lack of necessary inputs and cumbersome field operations. The trend in pearl millet production is generally decreasing across the communities with the exception of Zakoli in Yendi municipality due to lack of interest, declining soil fertility, erratic rains and declining yields.

The trend in cowpea production is mixed with responses ranging from increasing, static and decreasing (Annexes 2a and 2b). The prevalence of pests and diseases were the major reasons contributing to the static or decreasing trend of cowpea production. However, some farmers said cowpea production was increasing because of the existence of a ready market and high returns. Groundnut production is increasing across the region except at Sori No.1 where it is static because of low yields and at Jana where the trend is decreasing due low interest. Although soybean is relatively a new crop in the region the trend in production is increasing because farmers consider its production as an improved practice. Additionally, soybean improves women livelihood and is easy to produce and also a source of income, except in some communities where limited access to seeds limits its production. Both bambara groundnut and pigeon pea (*Cajanus cajan*) are considered minor crops which are mainly grown by men for food.

The major livestock species raised included large ruminants like cattle, small ruminants (sheep and goats) and local poultry (chickens, ducks, guinea fowls, pigeons, turkeys and doves). Most animals are kept for sale to realize income (Annexes 2c and 2d). However, 5-10% of the small ruminants and poultry are used for food. The men and few youths predominantly keep cattle. More women keep poultry, sheep and goats except in Dundo, Kpachi, Zugu and Sabegu in Tolon/Kumbungu district where women do not keep any form of livestock. Similarly, youths do not keep any form of livestock in Tingoli and Zugu communities of the Tolon/Kumbungu district. However, youths keep all categories of livestock in West Gonja and Savelugu/Nanton districts s well as Yendi municipality.

The trend in cattle production is decreasing in West Gonja and Savelugu/Nanton districts due to increased theft and poor or lack of housing (Annexes 2c and 2d). However, the trend is increasing in Tolon/Kumbungu district and Yendi municipality as cattle provides stable source of income, indicator of wealth and improved livelihood at the community level. Goat and sheep production is increasing across the four districts as these categories of animals are used for ceremonial functions, paying bride price, source of income and savings and general livelihood improvement. The trend in poultry keeping is mixed but more participants reported increasing trends because poultry birds are source of income and food. They are also used for rituals and savings. Those who reported decreasing trend revealed that prevalence of diseases increased bird mortality and hence reduced production.

**3.2.2 Analysis of off-farm livelihood activities in Northern Region**: Most processing activities done at the community level are for value addition for domestic home consumption. All crops produced are processed at the community level with the exception of rice at Duko and Manguli in Savelugu/Nanton district and cowpea and soybean in Tingoli in Tolon/Kumbungu districts where no machinery and lack of skills, respectively, were reported as bottlenecks (Annexes 3a and 3b). Processing activities identified in the communities included manual or mechanical threshing, winnowing and milling, Women and youths are mainly involved in crop processing activities. The multiplicity of forms for uses, ease of processing, ready market, increase in food preference and consumption are the major reasons for increase in trend of processing for a crop produce. Lack of processing skills and milling machines, low produce, and limited use are some of the reasons why processing of a produce could remain static or decrease.

All groups in the community sell crop produce. The youths are mainly involved in marketing rice, while women sell most legumes, rice and maize (Annexes 3a and 3b). The trend in the marketing of maize, rice, cowpea, groundnut and soybean is increasing because there is ready market, good price and increased consumption probably due to increase in population. However, the trend for sorghum and pearl millet is either static or decreasing due to low produce realized and the declining preference for these two crops across the communities

Processing of sheep and goats is mainly restricted to butchers and households performing funeral or naming ceremonies (Annex 3c). The cattle are rarely processed except by butchers who sell the meat to consumers. Poultry are mainly processed due to its ease of handling and domestic consumption. Reduction in livestock production due to increased mortality from diseases reduces processing of livestock. The trend in processing of animal products is mainly static or decreasing in West Gonja district mainly due to low patronage or lack of processing skills. However, the trend is on the increase in Savelugu/Nanton district in spite of reduced production as a result of disease prevalence. Savelugu/Nanton district is close to the regional capital, Tamale and this may provide ready market for livestock produce in the district. The availability of market expose farmers to more patronage and good price for the produce as shown by increase in trends of marketing of the livestock produce in the region.

Marketing of livestock involve men, women and youths. Most households are involved in marketing poultry and less for cattle and dog (Annex 3c). The trend in marketing of livestock is static in Sori No 1, decreasing in Damongo Zongo due to low patronage and increasing in Jonokponto due to ready market and good price in the West Gonja district. The situation in the Savelugu/Nanton district indicated a general increase due to ready market and good price offered by buyers. Sale of livestock generally provide source of income for other farming activities, ceremonies, paying school fees, and wedding, etc.

**3.2.3 Crop and livestock census and prioritization:** The major cereals identified and grown in the region include maize, sorghum, rice and pearl millet. In West Gonja district all the farmer groups ranked maize as the most important cereal crop grown across the communities (Annex 4a). All groups in Sori No.1 and Jonokponto ranked sorghum second, while millet was ranked 2nd in Damongo Zongo, the less popular crop in the district was rice. The order of popularity of the crops in West Gonja was: maize > sorghum > millet > rice. The major legumes grown were groundnut, cowpea, soybean, bambara groundnut and pigeon pea. Groundnut was more popular among all groups in most of the communities in the district. The order of popularity of the legumes was: groundnut > cowpea > soybean > bambara groundnut > pigeon pea. Poultry was the most popular livestock raised by all the groups and the ranking for livestock was in the order: poultry > goat > sheep > cattle > dog > pig

In Savelugu/Nanton district, rice was the most popular cereal crop as it was ranked first, followed by maize, sorghum and millet, respectively (Annex 4a). However, maize was more popular at Jana where all the groups ranked the crop first. Although mixed responses were observed for the legumes, the order of preference was soybean > groundnut > cowpea > bambara groundnut Poultry, sheep and goat were the livestock species raised by men, women and youths in the district. Cattle production is restricted to men and youths. The livestock species were thus ranked in the order: poultry > sheep > goat > cattle.

In Tolon/Kumbungu district the cereals were ranked in the order maize > rice > sorghum > millet (Annex 4b). Groundnut was more popular followed by soybean, cowpea, bambara groundnut and pigeon pea, respectively. All the groups are involved in the production of all the crop types grown in the region. Sheep > poultry > goat > cattle was the order of popularity of livestock species in the region. However, the women do not keep livestock and thus the practice is restricted to men and youths. The ranking in Zakoli in Yendi municipality revealed that the most popular crops were maize > rice > sorghum > millet, Women are not involved in sorghum and millet production. Soybean was relatively more popular among all groups. This was followed by groundnut, cowpea, bambara groundnut and pigeon pea, respectively. The livestock ranking in the Yendi district was in the order: sheep > goat > poultry > cattle. Cattle production was restricted to men and youth.

The most popular cereal crop in the northern region is maize followed by rice. Groundnut and soybean are the two most popular legumes grown, while poultry and sheep are the most popular livestock species raised by all groups. There is need to target and focus these enterprises for improving livelihoods in the northern region.

**3.2.4 Problem census, prioritization and coping strategies:** The general crop production problems that limit crop productivity in the project communities in the region included low soil fertility; *Striga* infestation; erratic rains; pest infestation; high weed infestation; high cost of pesticides; inadequate certified seeds; inadequate credit facilities; low extension and tractor services. The prevalence of livestock diseases such as pneumonia and diarrhea in small ruminants, ticks and new castle in poultry, inadequate feeds and watering points, especially during the dry season, lack of veterinary services and drugs and inadequate housing limit livestock production. Inadequate processing facilities, groundnut shellers and dryers, and unavailability of rice mill; lack of organized local market, low market prices, inadequate access roads and storage facilities, inadequate grinding mills and sometimes low demand for farm produce were some of the major processing and marketing constraints identified. The ranking of some of the major problems and strategies adopted by farmers to cope with such problems are presented in Annex 5.

At Dundo, the women group ranked high cost of land preparation as topmost priority problem, while high cost of fertilizers and lack of improved seeds were second and third crop production problems, respectively. The youths in Kpachi ranked erratic rainfall, low soil fertility and *Striga* infestation in that order of importance. Although the women group did not outline their coping strategies, the youths sow early maturing/drought tolerant varieties and conserve water by creating earth bunds to mitigate the problem of drought; apply chemical fertilizers/animal manure to cope with low soil fertility; and practice intercropping of cereals with legumes to reduce *Striga* infestation. About 40-100% of people in the community adopt these coping strategies and the trend is increasing, indicating that farmers observe some advantages from these practices.

At Tingoli, the men group ranked low soil fertility > weed infestation > *Striga* infestation as priority problems thus buttressing the ranking made by the youth group at Kpachi. The response at Tingoli also showed the women group ranking high fertilizer cost, land scarcity and high cost of improved seeds as priority constraints. The youths at Zugu also ranked inadequate tractor service for land preparation, low soil fertility and lack of credit, respectively as the major crop production problems in the community. Thus low soil fertility, *Striga* infestation, lack of land preparation equipment and low financial status to pay for input and services especially among women and youths are the major problems that cut across the region. Land scarcity is specific to women group probably because land ownership is skewed in favour of men in this region.

The livestock production problems ranked in Sabegu and Aibos revealed that ticks and worms were ranked first by both men and youths group. The other priority problems were anthrax/swelling and inadequate veterinary services and drugs. No coping strategies were articulated for these problems at the community level. Low farm gate prices for farm produce, low demand and inadequate means of transport to transport farm produce to nearby markets were some of the marketing problems ranked in decreasing order of importance. The farmers also mentioned inadequate grinding mills, shellers and dryers as some of the constraints to increased crop production.

**3.3 Resource Analysis and Opportunities in Northern Region**

The inventory of resources in Savelugu/Nanton district revealed the presence of farmlands and grinding mill in Kanshegu; farmland in Jana; dam at Libga; bore hole, teak plantation and solar light at Manguli. In West Gonja district, the resources included farmlands and borehole in ,Sori No. 1; farmlands in Jonokponto; grinding mill, borehole and filling station in Damongo Zongo, while in Frafra No 4 were farmlands and teak plantation.

The situation in Tolom/Kumbungu district showed that at Tingoli, a low resource community (Fig.1), there were potable drinking water, inadequate farm land and gravel mined pit. This explains the ranking of land scarcity as major crop production problem by women in the community. The resource inventory also included farmlands at Dundo; teak plantation, gravel pit, adequate farmland, pond for livestock, and potable drinking water at Kpachi being medium resource community (Fig. 2). Zugu is well resourced among the communities in the district with pipe borne water; cement well, teak plantation, adequate farmland, kraal and uncompleted bridge. Opportunities exist for further expansion of farmlands when the bridge is completed and irrigation farming in the low lying areas in Zugu (Fig. 3).

In Yendi municipality, Zang has farmlands, while Malzeri being average resourced has gravel pits, farm land, teak plantation, borehole, rain harvesting system, dam and insufficient farm land. Zakoli is poorly resourced with two bore holes and farmland. Pion is well resourced with bridge, low lying area where rice is produced, enough farmland, borehole, and cashew plantation and village market. Opportunities also exist for irrigated farming by underground water abstraction using wash boreholes and tube wells in the low lying areas where the water table could be high.

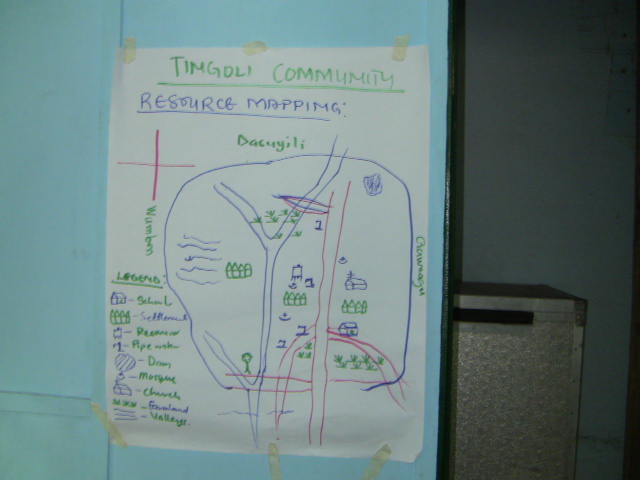


Figure 1. Resource map of Tingoli, a low resource community

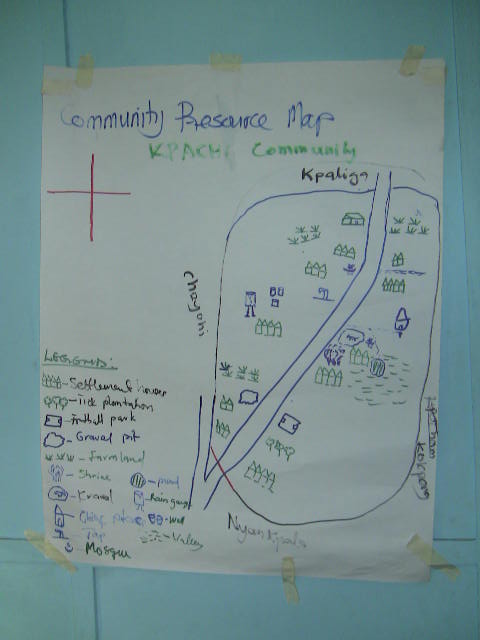


Figure 2. Resource map of Kpachi, a medium resource community



Figure 3. Resource map of Zugu, a well resourced community

**3.4 Market Channels and Market Network in Northern Region**

The market at Savelugu in Savlugu/Nanton district is central to all marketing activities of farmers in the five communities in the district. There is no community market at Kanshegu, Duko, Jana, Libga and Manguli in Savelugu/Nanton district. Farmers sell crop and livestock products and buy manufactured goods from the Savelugu, Nanton and Tamale markets (Fig.4). However, the link to Nanton and Tamale markets are not as strong as that of Savelugu. Farmers either sell directly in Savelugu market to middlemen or consumers, and sometimes the middle men enter the communities and buy the farm produce directly from the farmers, which they latter sell to retailers or consumers in other markets (Fig.5). Farmers in Manguli have strong market links with Tamale and Nanton than Savelugu market.

Savulugu

Market

Tamale Market

r

Yam, Livestock

Rice, Maize

Clothing, motor bikes

Bicycle, bunching mat Groundnut seed

Animal

JANA

Nanton

Market

Fowls and

Cassava

Figure 4. Market network in Jana in Northern Region

Consumers

Farmer

Retailers/Direct

Direct/

Middlemen

Tamale

Nanton

Savulugu

Figure 5. Market channel in Jana in Northern Region

In West Gonja district, there is no community market at Sori No.1 and Frafra No. 4, but farmers from the communities transact market business in Damongo, Kitampo and Sori No. 2 markets. Farmers in the communities sell cereals, legumes and livestock in Damongo and yam in Kintampo markets. They purchase vegetables, clothing, agro-chemicals, cutlasses and bicycle spare parts from the market. The farmers sell farm produce direct, but middlemen enter the communities periodically to purchase farm produce and sell to retailers and consumers in other markets. Jonokponto and Busunu have smaller markets, but also join bigger markets in Busunu, Yapei and Damongo. Farmers in these communities sell cereals, legumes and livestock and they purchase vegetables, bicycle spare parts and building materials from the big markets. Although farmers sell their produce directly, middlemen enter the communities periodically to buy farm products directly from the farmers.

The market network and channel in Dundo, Tingoli, and Sabegu communities in Tolon/Kumbungu district indicate that farmers patronize Nyankpala, Woribogu, Tamale and Kumbungu, markets. Farm produce are sold to individual middlemen and these include paddy and processed rice, maize, soybean, groundnut, processed groundnut (paste, oil and cake), livestock and vegetables. Items they buy back home include all that they send to sell at the lean season when there is shortage of food. A lot of rice and maize are produced at Zugu and farmers from the community patronize Kumbungu, Savelugu and Tamale markets. There is no organized group in the district that buys the produce from the farmers, but individual middlemen constitute the major channel for disposal of the produce.

Zang community in Yendi municipality does not have an organized local market. All produce are sold in Yendi market. The produce sold includes maize, rice, cowpea, sorghum and millet. The channel for produce disposal is from farmer to Savanna Farmers Marketing Company (SFMC) to consumer or from farmer to consumer directly. The SFMC is the only organized market channel through which farmers sell their produce. Malzeri farmers patronize Bonbon, Gushegu, Kpatina and Yendi markets. Produce sent there include maize, paddy and processed rice, groundnuts, small quantities of sorghum and millet and vegetables. Some soybean farmer groups in Mazeri go into contract agreement to get support in terms of farm inputs from SFMC and sell the produce to them after harvest, so Malzeri farmers have no problem selling their soybean. Farmers from Zakoli patronize Sakpaba, Yendi, Wonbong, Sabdoa and Yinsola markets. Those from Adibo go to Yendi, Bimbila, Tamale and Kumasi markets, while farmers from Pion patronize Yendi, Tamale, Katinga, Bonbong, Bimbila, Gushegu and Wapuli markets directly by individual and commercial farmers.

**3.5 Community Institutions: Linkages, Purpose and Strengths**

**3.5.1 Existing community groups and links to livelihood support services:** Individual farmers and those belonging to CBOs (Table 1) in most communities in the Northern Region benefit from livelihood support services provided by government and NGOs. . In Savelugu/Nanton district farmers are linked to service providers and they benefit from such institutions. The CBOs benefit from technology dissemination and farm inputs from MoFA and CSIR-SARI ; education, training and provision of school structures, feeder roads and boreholes from MiDA; bore holes, electricity, livestock technology and tree planting from NGOs like World Vision International (WVI), ADRA, CASPAD and OIC and education from GES. In general, MoFA often recover the cost of input supplied to farmers in kind.

Farmers in the CBOs in West Gonja district also benefit from the services offered by MoFA and CSIR-SARI. An NGO, Masara Na’arziki also provides farm inputs to farmers which are recovered in kind, while the Catholic Church and District Assembly provided solar lamps at Busunu. No organized CBO was identified at Frafra No.4, but individual farmers benefited from input and technology interventions from MoFA, CSIR-SARI and WEINCO. In the Tolon/Kumbungu district, government institutions such as MoFA, CSIR-SARI, and GHS provided services to farmers in Dundo community with no private sector or NGO participation. Institutions that work with inhabitants and CBOs in Tingoli included CSIR-SARI, UNICEF, MiDA, MoFA, and MASLOC, while MiDA, MoFA and GHS provided services in Zugu in Yendi municipality, the SFMC, MoFA, GHS, UNDP, CSIR-SARI, IFDC, ACDEP, CCFC, ADB and Fire Volunteers partner with individuals and groups depending on the strategy and convenience. ACDEP in collaboration with SFMC support farmers to cultivate and buy the produce after the season, while CCFC and IFDC train them.

Table 1. Names of Community Based Organizations identified in Northern Region

|  |  |  |
| --- | --- | --- |
| **District** | **Community** | **Name of Community Based Organizations (CBO)** |
| Savelugu/ | Kanshegu | 1.Maltiti Farmers Assoc.  2. Tunteiya Youth Assoc.  3. Beilanabra Shea butter Processing  4. Nubuniyini Rice Processing |
| Nanton | Duko | 1.Tiyuntaba Ataya Base Rice Producers,  2. Hpamanga Rice Processing,  3.Suglomboraburu Ataya Base Maize/Livestock Prod.,  4. Honyorisonmlagniba Ataya Base Maize Production |
|  | Jana | TRPA |
|  | Libga | 1.Rice and VegeAnnexGrowers Assoc.  2. Libga GAWU  3. Libga Women Shea butter Processing Assoc. (Kpamayga)  4. Kpamangu Kawusong Rice Processing  5. Suglumbora Soybean Farmers Assoc. |
|  | Manguli | 1.Suglumbore Boni Gbengka Male |
| West Gonja | Sori No. 1 | 6 groups (un named) |
|  | Johokponko | 5 small groups (un named) |
|  | Bususnu | 1.Tuntey Shea butter Processing  2. Naskure Shea butter Processing  3. Christian Mothers Assoc.  4. Kentiwale Production |
|  | Damongo Z. | 1.Bulonso Women Grp.  2. Kechito Fowl Production  3. Awurinkeni Production |
|  | Frafra No.4 | Not listed |
| Tolon/Kumbungu | Dundo | 1.Bonzali Youth Farmer Group  2. Yumbobgu Farmers Group |
|  | Kpachi | 1.Nnganwuni Farmers Group  2. Bobgu Nyaya Farmers  3. Pumaya Women |
|  | Tingoli | 1. Bobgu Nyaya Farmers  2. Tibomyam Farmers  3. Kpanmeng Farmers |
|  | Zugu | 1.Kpangmang Farmers Assoc.  2.Suglo Nbori Buni Farmers Group |
|  | Sabegu | 1.Biala Nnabra Women Group  2. Sahabiani Farmers Group |
| Yendi | Zang | 1.Nangbanyihi Vela  2. Kulinoli |
|  | Malzeri | 1.Fire Volunteers Farmers  2. Malzeri Soybean Farmers  3. Tiyumtaba Veg. Farmers |
|  | Zakoli | 3 unnamed: 1. KP1 2. KP2 3. KP3 |
|  | Adibo | Not listed |
|  | Piong | Not listed |

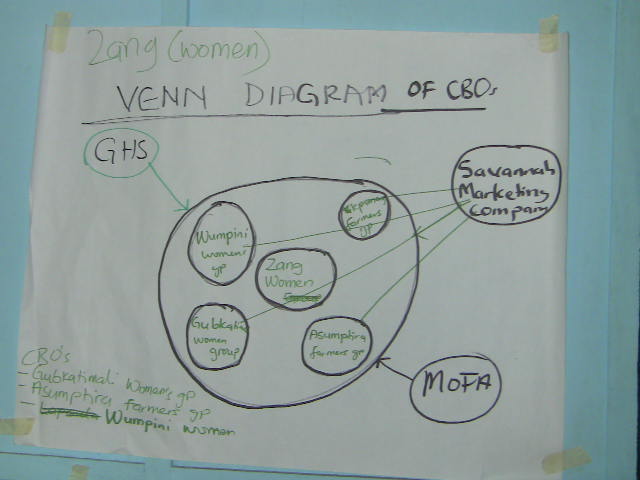


Figure 6. Venn diagram of women CBO in Zang, Yendi district



Figure 7. Venn diagram of youths CBO at Zakoli, Yendi district

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Figure 8. Venn diagram of CBO in Zugu, Tolom/Kumbungu district

**3.5.2 Strengths, weaknesses and purpose of selected CBOs:** The CBOs groups identified in Dundo, Kpachi and Tingoli in Tolon/Kumbungu district (Table 1) were established 1-7 years ago and are involved in crop production supported interventions. The membership of the groups in Dundo comprised males only, while membership consisted of both males and females in the groups in the other communities. The groups have not been trained or registered and have no bank account, except Pumaya Women group at Kpachi that has an account. Apart from owning some acres of land and attending meetings, the groups have not achieved much. The situation of the CBO groups in Zang in Yendi district is similar except that the groups are involved in cashew and soybean production and have received trainings from MoFA and SFMC on improved techniques in cashew and soybean production, respectively. The groups have been empowered financially which facilitated more school enrolment. All the CBOs identified in Malzeri were established 5-15 years ago have bank accounts, have large acres of farm land and are involved in soybean, vegetable and maize production. The Fire Volunteer Farmers Association has registered and some members were able to buy motor cycles and roof their buildings thus indicating significant achievement in livelihood improvement. All the CBOs identified in Zakoli are registered and have bank accounts. Also, they received trainings on financial management from ACDEP and livestock and crop management from MoFA. Some members were able to buy motor bicycles and animals and many women have been empowered financially.

Most of the CBOs identified and analyzed in the Tolom/Kumbungu district were weak and needed to be strengthened. The CBOs could be encouraged to open bank account and establish link with service providers that could identify and provide trainings in their area of operation. Owning bank accounts would enable the groups’ to access credit that can provide cash for payment for inputs and services that have been listed as priority constraints . The CBOs in Yendi municipality ranged from moderately strong in Zang to very strong in Malzeri and Zakoli. All CBOs could further be strengthened by embracing both crop and livestock production in order to exploit synergies in crop-livestock interactions.

3.5.3 **Capability of CBOs to resolve identified problems:** The PREA strategy requires the participation of CBOs in resolving identified problems in the community. The CBOs identified have some experience in working with government institutions and NGOs and showed their readiness to partner with the project during the community analysis. The CBOs selected their lead farmers and community seed producers during the exercise and the number will increase during the subsequent years of project implementation. The CBOs should be linked to agro-input and output markets and their capacities strengthened in crop and livestock management practices and entrepreneurial skills. Both intra and intercommunity networks among CBOs should be strengthened and organized agricultural produce companies should be sourced from nearby cities and linked to the producers association at the community level. The coping strategies that are prevalent at the community levels should be improved upon or tested along with improved best practices to resolve the priority problems.

**4.0 RESULTS OF COMMUNITY ANALYSIS IN UPPER EAST REGION**

**4.1 Biophysical Characteristics and Agro-environment in Upper East Region**

The Upper East Region (UER) which is located in the north eastern section of Ghana lies between longitude 1015’W to 005’E and stretches from latitude 10030’N to 1108’N. The region shares borders on the east with the republic of Togo, on the north with Burkina Faso and to the west with Upper West Region. It occupies the greater part of Sudano-sahel savanna zone of Ghana. The physical geography of the region is marked by the line of the Gambaga escarpment, running West-East along its southern edge and marking a division with lower density, higher-rainfall terrain, which is largely part of Northern region. The average annual rainfall in the region is some 900-1000 mm (Blench, 2006a). The region is characterized by a short rainy season which is erratic, from May to October and long dry season that stretches from October to April with hardly any rains. The most common economic trees are the shea nuts, *dawadawa*, baobab and acacia with ground flora of grass, while the soils are predominantly sandy loam with some gravel (Annex 6). The area is characterized by small land holdings of low input-output farming systems, which has dire impact on household food security such as availability, access, quality and price.

The population comprises about 60% females and 40% males who live in scattered settlements. The hierarchy of leadership in most of the communities shows that the chief is the head of the community followed by the assembly man. In some communities like Sakote, the queen mother is next to the chief. The underlying social structure in UER is the extended patrilineal family. Families form part of lineages and these in turn compose clans. The region is highly diverse ethno-linguistically, and the major ethnic groups are Kusasi, Moshie, Busasi, Mamprusi, Bisa, Fulani, Hausa and Zabarma (Annex 6). There is no *lingua franca* that serves as an effective medium of intercommunication although a type of Hausa is often used as a market speech in large towns (Blench, 2006a).

The farming system in the region is based around cereals and legumes which are common in lower rainfall zones elsewhere. Cultivar diversity is low, probably a response to poor soil fertility. Animal traction is extensively used, even in ridging that could improve rooting and counteract erosion (Panin, 1986). Actual soil fertility is determined as much by the exceptional concentrations of population allied with a low-input farming system. Throughout most of UER, except in the extreme west, there are virtually no elements of the system that encourage the return of nutrients to the soil. The crops are produced under continuous monoculture in which soil resources are steadily depleted and average crop yields are gradually declining. The average farm size is 2.5ha/crop with low yields due to the highly degraded soils. Livestock roam freely in the dry season, but in the rainy season they are taken away from the area to avoid damage to crops and the manure is effectively lost. Most trees, even leguminous ones, have been removed from the farms in order to increase cropping area. Firewood is so short that the stover of cereals are removed from the farms and used to cook food, thus not returning their organic matter to the soil. The elimination of almost all types of ground cover leaves the area patched and mostly bare landscape. Consequently, the torrential early rains cause soil erosion; with heavy surface run-off and poor moisture infiltration (Blench, 2006a).

Major crops produced in the area include pearl millet, sorghum, maize, rice, groundnut, cowpea, soybean and onion (*Allium cepa* L). However, millet is resilient to the environment of the zone. There are two groups of millet cultivars, a short-season millet harvested in July and a long-season millet, harvested in November or December. The dominance of millet in such a high rainfall area is striking as millet is usually associated with sub-desert regions. The early millet is inter-planted either with late millet or sorghum in fields close to the compound where fertility is highest. The further fields are planted with sorghum intercropped with pulses, especially cowpeas and occasionally groundnuts. At smaller dam sites, dry-season cultivation is mainly vegetables, most commonly onions and tomatoes. In the early period, lettuce, pumpkins, cucumbers and watermelon were brought in, but these are now of minor significance. Onion cultivation is particularly popular and represents one of the most important agricultural exports from the region (Blench, 2006a).

**4.2 Existing Farming System and Problem Analysis**

**4.2.1 Analysis of on-farm livelihood activities in the Upper East Region:** All gender groups are involved in crop cultivation in the region. The major cereal crops cultivated by all groups include early millet, late millet, maize, sorghum and rice, while the major legumes grown are groundnut, cowpea, soybean and bambara groundnut (Annexes 7a and 7b). In Talensi/Nabdam district, more men are involved in groundnut production, while more women are involved in maize production. Soybean is popular among all groups in Bongo district as 80 to 100% of the groups are involved in its production. Greater proportion of all cereals produced is used for food with 10-50% devoted for cash. The legumes are essentially grown for cash with 10 – 50% used for food. The millets constitute the major food crop and soybean a major cash crop with 90% each devoted for food and cash, respectively.

The trend in the production of all crops is decreasing except for maize in the region. Maize production is increasing across the communities (Annex 7a). The reason for the increase as suggested by the participants was that maize is a new crop that respond remarkably to fertilizers when compared to sorghum and millet. There is also increasing market opportunities for maize and maize products across the region. Declining soil fertility, erratic rains, and head insects were some of the reasons advanced for decline in production of early and late millet, sorghum and rice. Prevalence of leaf diseases, low soil fertility and lack of improved varieties are discouraging farmers from production of groundnut and bambara groundnut, while these factors along with insect pest infestation reduce cowpea production. Lack of processing skill was the only reason advanced for decline in soybean production.

The situation in Bawku municipality showed that more than 70% of households produce millet, sorghum and maize (Annexes 7b and 7c). Around 40-60% produces rice, soybean and groundnut. However the proportion of households producing sorghum and millet is declining while maize and soybean is increasing. Cowpea and bambara groundnut production were steady while groundnut production is declining. Communities with access to water source for dry season gardening engage themselves in dry season farming to supplement the rainy season harvest and to generate additional income. Some farmers obtain more incomes from their dry season farms than the major rainy season farming. Maize is becoming an alternative cereal crop cultivated by farmers in Binaba and Bawku West district generally for food in the place of millet due to the comparatively higher yields obtained especially when the appropriate cultural practices are followed. In recent years, also poor yields are being recorded in millet. In addition, maize can be used to prepare various dishes compared to millet. Maize is therefore cultivated both as a cash crop and for food. The cultivation of millet would however, not stop because it is used for the preparation of some traditional meals and for cultural performances. Improved varieties of millet therefore need to be promoted. Women farm mostly to supplement the family food normally provided by the man and for cash to meet their basic and social needs such as buying clothes for themselves and their children, bowls, supporting the payment of children school fees etc. They mostly produce rice as well as groundnuts though on small plots of land.

Men are involved in the production of all types of crops, but more men produce maize, sorghum and millet than women. The women do not produce sorghum and late millet, but more women are involved in the production of legumes such as cowpea, groundnut, soybean and bambara groundnut. More youths are involved in the production of maize and soybean; and some minor crops like sesame and *neri* in Binaba. Men produce the cereal crops mainly for food, while rice and legumes are mainly produced for cash by all groups. The trend in the production of sorghum, millet, rice and groundnut is decreasing due to declining soil fertility, pests and diseases infestation, drought and inadequate land. The trend in soybean production is increasing because it is considered nutritive and does not require external inputs like fertilizers and pesticides.

Poultry birds such as local fowl, guinea fowl, ducks and turkey are raised in Talensi/Nabdam and Bongo districts. Small ruminants such as sheep and goats, and large ruminant (cattle), pigs, dogs and donkeys are raised by all groups in the communities (Annex 7d). Although all groups keep all categories of livestock in the region, more women keep cattle and poultry than men and youth in Talensi/Nabdam district, while more men and women keep pigs than youths in Talensi/Nabdam and Bongo districts. Greater proportion of all categories of livestock produced is sold for cash. Cattle are rarely used for food, while dog, poultry and pigs are the most important food animals in the region. The trend in livestock production is decreasing for all categories except for poultry which is increasing across the region but static in Balungu in Talensi/Nabdam district. The increasing trend is because poultry is multipurpose and is used for rituals, festivals, payment of dowry, high quality food and attracts quick cash. However, poultry production could be marred by the prevalence of Newcastle disease which causes high bird mortality. The decrease in trend for other categories is due to decrease in grazing area for cattle and donkeys, high cost of food and increase in incidence of rabies for dogs, high cost of drugs, feeds and housing for pigs

The situation in Bawku municipal and Bawku West district (Annexes 7e and 7f) showed that cattle, goat, sheep and poultry production is popular among all groups in the 10 communities. In addition, more youths also keep dogs, more women keep donkeys and more men keep cattle than the other groups. Greater proportions of all animals are raised for cash than food. Goats, poultry and pigs are the main food animals, while cattle are raised mainly for cash and donkeys are work animals as means of traction and transport. The trends in the production of these animals differ across the communities. In Bawku West district, the groups gave divergent views (Annex 7e). The men group reported decrease in production of all categories of animals at Yarigu, cattle at Bianaba, poultry at Tilli and donkey at Tanga, among others. The women and youth groups reported increases in trend of production of these animals. All the groups reported increase in trend at Tanga, except for donkey. The trend in cattle production is decreasing due to inadequate grazing area and prevalence of diseases. The trend in the production of sheep, goats, pigs, donkeys and dogs is increasing in Bawku municipal because the small ruminants and pigs are prolific, and provide ready cash, there is improved vaccination for poultry and the use of donkeys as work animals is on the increase (Annex 7f). However, high keet mortality in guinea fowl rearing due to prevalence of diseases, inadequate grazing area and theft are some of the major reasons for decrease in production of these animals across the Bawku area.

**4.2.2 Analysis of off-farm livelihood activities in the Upper East Region**: All groups in the Talensi/Nabdam district are involved in the processing of cereals and legumes with the exception of rice (Annex 8). Among the cereals, sorghum is processed into *pito*, a local brew whose trend is increasing due to high demand and ready market in the region. Maize is processed into *kenkey*, and millet into *koko* (watery porridge) and *masah* (fried paste) but the demand for these products is low and hence there is less incentive in the processing and the trend is decreasing. Groundnut is processed into oil, paste and cake. The oil is competing with other cooking oils that are cheaper and the trend is gradually decreasing. Soybean is processed into *dawadawa* (local seasoner) and is competing with the products from the locust bean. All groups are involved in the marketing of agricultural produce. Processing of livestock products is not common at the local community level except for domestic consumption and ceremonies or rituals. The central markets at Bolgatanga and Bawku are major centers for livestock marketing and processing.

The situation in Bawku municipality and Bawku West district showed that soybean, rice, sorghum and groundnut were the dominant crops where value-addition and secondary processing were mostly carried out by women and women groups (Annex 8). *Dawadawa* processing is also a common feature using either soybean or the locust bean seed. This is done mostly during the dry season as an income generation activity to supplement family income. Small to medium scale micro-enterprises for women should consider involving women along the value-chain businesses of these crops. The processing of cereals and legumes is an income generation activity for women. Maize apart from its use as food is processed into flour for sale or food such as *kenkey* and *banku.* Millet is used in preparing millet cakes for sale, but much of it is consumed by the family as not much yields are obtained in recent years. Many farmers are into the cultivation of cowpea and soybean due to its high market value and comparatively high yields obtained. In fact soybean is gradually replacing groundnut because yield of groundnut is declining. Some farmers have even stopped cultivating it, because the yields obtained do not merit the tedious work involved in its cultivation.

The processing of agricultural products for storage is mainly done by women. The men and youth help during the harvesting and threshing of the produce with the youth playing a major role since they are physically stronger. The female youth assist their mothers. Processing for the market is an income generation activity for women, for example processing sorghum into malt, soybean into *dawadawa*, groundnuts into oil and paste. Middlemen come in from Bolgatanga, Navrongo and sometimes beyond to purchase the processed malt and *dawadawa*. The district is noted for its premium *dawadawa* and malt. Men and the Youth are found more in the processing of animals into *kebab* but women still dominate if it is to be smoked or fried for sale.

**4.2.3 Crop and livestock census and prioritization in Upper East Region:** Early millet is the major food crop in Talensi/Nabdam district as the crop was ranked first or second across the communities (Annex 9a). In this district, the order of ranking of crops for food was early millet > sorghum > maize > late millet > rice. Sorghum is the leading food crop in Bongo district followed by early millet, maize, late millet and rice in that order. Early millet and sorghum are considered crops of food security, because they mature early and provide food when other crops have not matured. The ranking of the cereals for cash showed that sorghum and maize are the major cash crops in the two districts. Maize is gradually gaining dominance over sorghum as cash crop because it responds significantly to fertilizer application and therefore produces higher grain yields.

The ranking of the legumes for food was in the order: groundnut > cowpea > Bambaranut > soybean. Groundnut paste and oil are used for soup, while whole grains are eaten fresh or cooked, while cowpea is cooked and constitute simple meal for the family. The longer cooking time of bambara groundnut and inadequate knowledge of recipes from soybean are the major reasons for their low ranking for food. Local farmers largely prefer fast-cooking, early varieties of Bambara groundnut with large, cream-coloured seeds. The ranking of the legumes for cash was similar to that of food as the ranking was in the order: groundnut > cowpea > bambara groundnut > soybean. Thus groundnut and cowpea are the two most important leguminous food and cash crops in the region.

Poultry is the most important among the livestock species as it was ranked first for both food and cash across the communities in the region (Annex 9a). The men ranked dog as the second most important food animal followed by goat and sheep in that order in Talensi/Nabdam district. The order of ranking for the women group was: poultry > goats > sheep > pig > dog > cattle > donkey. The order of ranking of the animals in Bongo district was: poultry > goat > sheep > cattle > pig > donkey > dog. The ranking of the animals for cash was similar to that for food in the region. Other uses of the animals are for traction and transport by cattle or donkey; dogs are pets and provide security. It was noted that both dogs and donkeys become food animals when they grow old and can no longer provide their primary functions.

In Bawku,West and Bawku Municipal, maize and millet were co-dominant in terms of contribution to livelihood (Annex 9b). Maize is now preferred due to its comparative high productivity compared with millet and sorghum. Secondly maize can now be used for same local food dishes as millet and sorghum. Soybean production is gradually increasing due to high income value, compatible intercropping with maize and various forms of utilization. Some development partners are promoting soybean production by way of providing credit and inputs for production. The domestic fowl plays an important role in household livelihood. The advantages of the domestic fowl include low costs of production and short gestation period. Goat and pig production were the second most economic animals particularly to women and female-headed households. Cattle were owned by few households and mainly used for tillage. Majority of households owned donkeys, which are mainly used for traction and transportation of farm produce and goods to nearby markets.

**4.2.4** **Problem census, prioritization and coping strategies**: The most widespread crop production problems identified in the Talensi/Nabdam and Bongo districts are unreliable or erratic rains, low or declining soil fertility, lack of improved seeds, inadequate land preparation equipment, insect pests, diseases and weeds; and lack of credit (Annex 10). These problems account for the major decline observed in crop production in the region. Farmers cop with unreliable rains by planting early improved and/or drought tolerant varieties, which have high and stable yields and attract higher market price. However, seeds of these varieties are not readily available and require higher inputs than the local cultivars. Application of farm yard manure, chemical fertilizers and intercropping cereals with legumes are the major coping strategy for low soil fertility, but inadequate access and high cost of transportation are the major factors limiting the use of farm yard manure and fertilizers in the region. Farmers are able to remedy the problem of land preparation by using animal traction which ensures early land preparation. However, there is limit to the use of animal traction in heavy soils or rice ecologies which are difficult to cultivate; also animal traction is inadequate and takes a long time to clear a larger land area, thus delaying land preparation and planting. About 60-90% of the respondents are involved in these practices and the trend is increasing given the benefits farmers derive from such coping strategies. The major livestock problems identified include: new castle disease (NCD) in poultry, high keet mortality in guinea fowls, poor housing for pigs, and poultry and Peste des Petits Ruminant (PPR) in small ruminants. Early reporting of PPR outbreak to MoFA, treatment and vaccination are the major coping strategies, but cost of treatment increase the cost of production. Artificial brooding of guinea fowl keets has reduced mortality and many farmers now own brooder houses.

In Bawku municipal and Bawku West district the most recurring constraints were perennial drought, decreasing soil fertility, lack of access to credit, high cost of agro-inputs, degraded grazing lands, inadequate watering points for animals and lack of bullocks and tractor services at planting (Annex 10). High mortality across all kinds of animals was recurring constraints in all communities. The livestock mortalities and theft are discouraging the youth from rearing them even though they say it is good to have them. This is because they are sold to buy food to supplement the family food when it runs short during the long dry season in addition to solving other social and cultural obligations. “One can lose the entire flock or herd”, they complained. The veterinary services of MoFA need to be strengthened in order to conduct routine vaccination of animals to avert this problem and hence the use of Community Livestock Workers (CLWs) should be encouranged.

**4.2.5 Vulnerability to shock or stress and coping strategies:** The farming system in the region is vulnerable to drought, flood, bush burning and destruction of farm land by small scale miners (Table 2). Although each of these factors is important, more grievous are the problems of bush burning and destruction of farm land by small scale miners. What is more worrisome is that these grievous problems are caused by humans competing for use of natural resources. Community education should be intensified at all levels in the region to reduce the depletion of natural resources that is increasing as a result of human activities. Drought and flood, although natural are also indirectly caused by human activities. Thus all groups in the community are vulnerable to these hazards. However, women and youths have less access to land especially in Bawku municipality and Bawku West district and can be considered being more vulnerable since they have less alternatives.

Table 2. Shock or risk and coping strategies in Upper East Region

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of shock or risk** | **Relative importance (1-10)** | **Causes** | **Frequency of occurrence** | **Coping strategies** |
| 1.Drought | 5 | Natural, degraded environment | Occasional, less frequent | Plant early maturing varieties |
| 2. Flood | 4 | Natural, silted rivers and dams | Occasional | Avoid low lying areas by 50 m, dry season gardening, sell animals to supplement |
| 3.Bush burning | 7 | Hunters, children, smokers | Every dry season | Use early maturing varieties, gather crop residue |
| 4.Destruction of farmland | 7 | Small scale miners | High | Community education, limiting mining operations |

**4.3 Resource Analysis and Opportunities in Upper East Region**

**4.3.1 Resource maps:** the resource maps of selected communities in the region are presented in Figures 9 to 13. There are diverse opportunities in communities with low lying areas, rice valleys and grazing areas. These provide opportunities for both rainfed and irrigated farming and livestock production. Opportunities exist in Yidongo, Binduri, and Baare for irrigation and dry season farming. Googo is a crop processing center with presence of several grinding mills.

|  |  |
| --- | --- |
| F:\DCIM\101MSDCF\DSC04892.JPG  Figure 9. Resource map of Baare in Talensi/Nabdam district | F:\DCIM\101MSDCF\DSC04887.JPG  Figure 10. Resource map of Yidongo in Bongo district |
| Figure 11. Resource map of Binaba in Bawku West district | Figure 12. Resource map of Binduri in Bawku municipal |

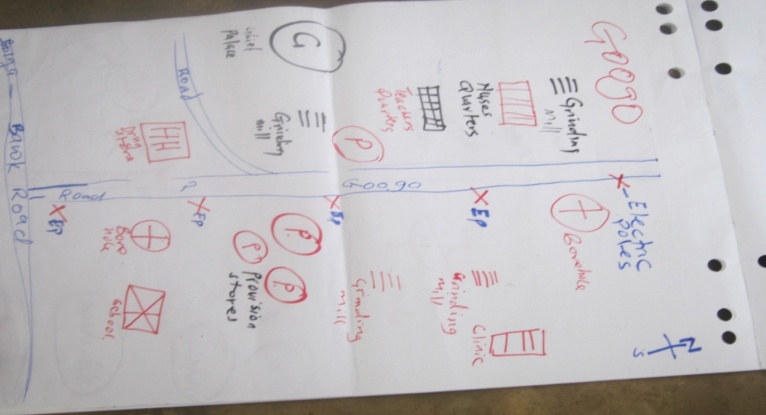
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Figure 13. Resource map of Googo in Talensi/Nabdam district

**4.3.2** **Cropping calendar**: The cropping calendar of farming activities in the region during any rainy season is summarized in Figure 14. Farming activities start in March with land clearing and run through December when farm produce are harvested and marketed.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Activity/operation** | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Clearing |  |  |  |  |  |  |  |  |  |  |  |  |
| Land preparation |  |  |  |  |  |  |  |  |  |  |  |  |
| Planting |  |  |  |  |  |  |  |  |  |  |  |  |
| Filling in |  |  |  |  |  |  |  |  |  |  |  |  |
| 1st weeding |  |  |  |  |  |  |  |  |  |  |  |  |
| Fert. Application (1st ) |  |  |  |  |  |  |  |  |  |  |  |  |
| 2nd weeding |  |  |  |  |  |  |  |  |  |  |  |  |
| Transplanting |  |  |  |  |  |  |  |  |  |  |  |  |
| Top dressing |  |  |  |  |  |  |  |  |  |  |  |  |
| Earthen up |  |  |  |  |  |  |  |  |  |  |  |  |
| Harvesting |  |  |  |  |  |  |  |  |  |  |  |  |
| Drying &processing |  |  |  |  |  |  |  |  |  |  |  |  |
| Storage |  |  |  |  |  |  |  |  |  |  |  |  |
| Marketing |  |  |  |  |  |  |  |  |  |  |  |  |

Figure 14. Cropping calendar of farming activities in Upper East Region

The activity pattern of the people is mainly agricultural and some amount of petty trading. Rain-fed agriculture commences from May to November while dry season irrigated agriculture is done between November and April each year.

**4.3.3 Seasonal calendar of resource availability in Bawku municipal:** High food availability concurs with harvesting which starts from August and reaches its peaks by October to November while chronic shortages occur from May to July (Table 3). Availability of food, cash and labour may vary among households. Labour shortage occurs during the time of planting and harvesting of major crops. However, during the periods of food scarcity, farm families offer labour for cash to able them purchase foodstuffs for the family.

Table 3. Seasonal calendar of resource availability in Bawku municipal

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Resource availability** |  | **Month of the Year** | | | | | | | | | | |
| **Jan** | **Feb** | **Mar.** | **Apr** | **May** | **Jun** | **July** | **Aug.** | **Sept.** | **Oct.** | **Nov.** | **Dec.** |
| Cash available |  |  |  |  |  |  |  |  |  |  |  |  |
| Cash not available |  |  |  |  |  |  |  |  |  |  |  |  |
| Chronic cash shortage |  |  |  |  |  |  |  |  |  |  |  |  |
| Food available |  |  |  |  |  |  |  |  |  |  |  |  |
| Food not available |  |  |  |  |  |  |  |  |  |  |  |  |
| Chronic food shortage |  |  |  |  |  |  |  |  |  |  |  |  |
| Labour available |  |  |  |  |  |  |  |  |  |  |  |  |
| Labour not available |  |  |  |  |  |  |  |  |  |  |  |  |

**4.3.4 Soil fertility assessment and management practices:** The classifications of soils in the Talensi/Nabdam and Bongo districts vary from gravel, gravel loam, sandy loam to clay loam and clay. The fertility status of these soils is generally low with few pockets of fertile soils observed in Onchocerciasis-free zone in Namoo Abbaskoma in Bongo district. The farmers testified that crop yields on such soils are low if soil amendments such as mineral and/or organic fertilizers are not applied. In addition, the soils are amenable to erosion by water and wind; *Striga* infested; and prone to water logging when located close to water bodies. Farmers apply fertilizers or homestead refuse as soil fertility management practice or integrate the options by use of chemical fertilizer and organic amendments such as homestead refuse and farm yard manure in an integrated nutrient management. Conservation tillage practices include planting on the center ridges, and field drainage to remove excess water from waterlogged fields. Soils in Bawku districts were described as fairly infertile or somehow degraded by the communities. In some areas, crop survival is virtually impossible without soil amendment. Some community lands were quite rocky and sometimes with many low lying valleys. Animal manure, chemical fertilizer, and household refuse are the main soil amendments used by the farmers in the districts. Problem of *Striga* infestation often featured prominently in most community discussions.

**4.4 Market Network and Market Channels**

**4.4.1** **Market network:** Bolgatanga remains the principal regional market, but Bawku is also a significant trading centre. In Bawku municipality and Bawku West district, the marketing of legumes and cereals is done by women. Even if the man has some farm produce to sell, it is the woman who sends them to the market to sell and then hand over the income to the man. The exception is when the produce is plenty, then a middleman is arranged to purchase in bulk from the man. The marketing of livestock on the other hand is done by men. Community members who are typically farmers do trade in their immediate neighbouring communities. As shown in the analysis in Figures 15, 16 and 17, farmers go to the other markets with their farm produce to sell to obtain cash to solve other domestic and capital problems and also buy manufactured goods.



Figure 15, Market network of Ninkongo in Bawku municipal

The farmers may also buy soup ingredients, cosmetics, and soap. Access to market is not a major problem as distances to nearby markets are less than 30 km. Only few agricultural produce and livestock are traded in these local markets. The rural folks in turn buy household provisions and clothing from those markets but mostly from the major markets where the commodities are cheaper and where they obtain higher prices for their agricultural produce. Communities like Googo and Ninkongo are engaged in some cross border trade with other communities in Burkina Faso and Togo. Agro-inputs are obtained from near-by markets. Thus access is not a major challenge; however, high cost of inputs was a recurring problem. Inadequate access to improved seed and delay in arrival of fertilizer was frequently mentioned as the major marketing problems.

Pito, Malt,

Livestock

Livestock, Cereals, Agric. Inputs

Cereals, Legumes, Chicken, Guinea Fowl, Shea butter

Household Needs, PITO, Malt, Shea nuts

Figure 16. Market network of Sakote in Talensi/Nabdam district

**G**

Vegetable seed

Shea nuts

Vegetables, Sorghum, Groundnut,

Vegetable, millet, Rice

Paddy rice, groundnuts

Groundnut oil, malt, vegetable seeds

Sorghum

Figure 17. Market network of Dua in Bongo district

**4.4.2 Market channels:** Binaba market is one of the major markets in the Bawku West district, with middle men and women coming in from Bolgatanga and Zebilla to buy farm produce such as maize, cowpea, groundnuts, bambara groundnut millet as well as poultry and livestock for retailing in their markets. People from neighbouring communities (Zongoyire, Apotdabogo, etc) also come to purchase farm inputs, soup ingredients, provisions and other essential commodities. On the other hand, farmers from Binaba community also go to Bolgatanga, Bawku and Zebilla markets to purchase farm inputs such as seed and agro-chemicals not available in their communities as well as for other essential goods. In addition, the farmers go to the bigger towns for banking services and to sell processed farm produce.

Table 4. Work sheet for farm inputs at Binaba in Bawku West district

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of input** | **Source of input** | **Availability** | **Quantity** | **Unit price** |
| Fertilizer | Binaba ,Zebilla and Bolgatanga | Sometimes  Unavailable | Depends on allocation/ funds | NPK-GH₵30.00  Sulphate-GH₵25.00 |
| Improved seed | MoFA and input dealers in Zebilla, Bolgatanga | Mostly available | Depends on need | Depends on type of seed and variety |
| Chemicals | Dealers in Zebilla, Bolgatanga and Bawku | Always available | Depends on funds | Varies but ranges from GH₵ 7-GH₵15 |
| Sahelian goats and sheep | Burkina Faso and Togo | Always available | Depend on need | Ranges between GH₵80 .00 --GH₵150 |
| Sprayers | Dealers | Always available | Depend on need | GH₵70-GH₵150 |
| Protective clothing | Input dealers | Always available ‘ | Depend on need | - |

Four (4) input dealers were identified in Binaba. One of them, Madam Victoria Asaaro who was present at the meeting and was interviewed. Madam Victoria Asaaro who is 40 years old and has been in the input sales business for the past 4 years (Table 4). She sells fertilizers, seeds, pesticides, sprayers and protective clothing. She received training from MoFA on safe input handling and business management. Her constraints are that she has limited storage space for the fertilizer.

Table 5. Inputs market matrix at Binaba in Bawku West district

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Inputs** | **Source** | **Quantity** | **Buying price** | **Selling price** | **Handling cost** |
| Seeds | Bolgatanga and Zebilla | As demanded | Maize-GH₵1.30-GH₵1.50per kilo | GH₵1.50-GH₵1.70/ kilo | 80p –  Gh₵1.00 /bag |
| Fertilizers | Bolgatanga and Zebilla | Amount allocated and funds available | Compound-GH₵28.00  Sulfan or sulphate-₵23.00 | NPK -GH₵30.00  GH₵25.00 | “  “ |
| Pesticides | Bolgatanga and Zebilla | Based on funds and demand | Gh₵55-78/lit | Gh₵57-80/lit | 50p/box |
| Livestock species | Togo and Burkina Faso | Not in that business | - | - | - |
| Feeds | Not available | - | - | - | - |

According to Madam Victoria Asaaro, the quantities of fertilizer allocated to her was insufficient (600 bags /dealer each time). She had 5,000 bags for the whole season last year. This allocation was from Government’s fertilizer subsidy programme. The fertilizer prices quoted are also the subsidized prices. The unsubsidized prices bought for the dry season gardens were Ghc45.00/bag for both compound (NPK) and Sulphate brands of fertilizers. She admitted that has limited knowledge on safe and efficient use of pesticides and record keeping and that she needs training on these issues.

**4.5 Community Institutions: Linkages, Purpose and Strength**

**4.5.1 Existing community groups and links to livelihood support services:** Several **CBOs** exist in each community in the region (Table 6). The groups and farmers in the communities are linked to government agencies such as MoFA, GES, GHS, CSIR-SARI and Irrigation Company of Upper Region (ICOUR). Nongovernmental organization like the WVI is also linked to the CBOs in Baare. The Forestry Commission, ONCHO Transport Border and Bongo Rural Bank are patronized by farmers at Soe Yindogo in Talensi/Nabdam district. In Bawku West district, the most visible NGOs that provide services to farmers include Toende Rural Bank, ADDRO (Anglican Diocesan Development Relief Organization), Community Development Initiative (CODI), Irrigation Development Authority (IDA), WEINCO Company and ActionAid, among other agencies.

It seems each community has received assistance from an NGO either in the past or currently, albeit different intervention programmes. Women seem not to know the names of agencies which are or have worked with them, and often associated those organizations with kind of support or name of project staff. Few of these were ActionAid, WVI, BEWDA, IFAD, ZOVFA, etc, though presently weak linkages appear to exist between the partners. Programmes of these development agencies appear uncoordinated, thus efforts to integrate these interventions will be beneficial to the target rural households in the current project.

Table 6. Names of Community Based Organizations identified in Upper East Region

|  |  |  |
| --- | --- | --- |
| **District** | **Community** | **Name of Community Based Organizations (CBO)** |
| Talensi/Nabdam | Sakote | 1.Kuntabga group  2. Daasan group  3. Naboukin  4. Widows and orphans  5. Tankpa  6. Kugri group |
|  | Winkogo | 1.Asongtaba farmers  2.Asakibotaba  3. Maasam Lazime  4.Moaretime farmers |
|  | Balungu | 1.Apamyine group  2. MoFA group 3. |
|  | Baare | 1.Disdem farmers  2.Sakparadiemar  3.Songtagtaba women  4.Tiyeltaaba women  5. Pusarzeh youth |
|  | Sheaga | 1.Sag kop farmers  2.Nongtaba farmers  3.Songtaba farmers  4.Mataba farmers |
| Bongo | Gworie | 1.Asarikua farmers  2.Akokare farmers  3.Adolipore  4. Gworie IPM  5.Akapikre |
|  | Beo M. | 1.Azontaba men  2. Noyine group  3. Anartaaba group |
|  | Soe Yindogo | 1.Asungtaaba women  2.Alagtaaba men  3. Asena women group |
|  | Namoo Abas. | 1.Abaskoma women group  2.Abaskoma men group |
|  | Dua | 1.Akafabil men  2.Alaktum group  3.Kumsaga group  4.Alaskoma group  5. Asomtaba group  6.Dua women group |
| Bawku West | Binaba | 1.Kopela women dev. Assoc.  2.Amaltaba women  3.Asongtaba men  4.Annanoori youth  5.Ateltaaba maize farmers  6.Alamtaba youth  7.Tes-um etc |
|  | Tilli | Not listed |
|  | Tanga | 1.Red cross mothers  2.Mlother to mother support  3.Asung-Taba women  4.Alagsi-Taba women  5.Atolembesi women  6.Wigga women  7.Toned women |
|  | Yarigu | 1.Asongtaaba group  2.Akakom group  3.Onion farmers  4.Alaataba maize  5.Ateeltaba group |
|  | Googo | 1.Puag-Eyire  2. Tilagse-Mal  3.Abori Tuma group |
| Bawku Municipal | Kaade | 1.Zuuri Veg. Farmers  2. Apiagsare cotton  3.Asung-Taba farmers  4. Amal-Taba farmers  5.Kaade Asongtaaba women |
|  | Nafkolga | 1.Aboritaba farmers group  2.Asungtaaba farmers assoc. |
|  | Nayoko | 1.Anongtaba  2.Abodbego  3.Sinkuwa Asongtaaba  4.Mothers club  5.Amaltaaba farmers  6.NakunNaatin farmers  7.Ayandaboo  8.Balensowa |
|  | Binduri | Asuga farmers group |
|  | Ninkogo | Not listed |

**4.5.2 Strengths, weaknesses and purpose of selected CBOs:** Assessment of the activities of CBOs in Nayoko and Binduri in Bawku municipal showed that the CBOs can be classified as medium in strength with no bank account and external financial support (Table 6). *Anontaba*, a CBO in Nayoko was established in 2008. The purpose of the group is to support each other in farming and building activities, among others. The group comprises of 12 members (8 males and 4 females) and meets monthly. The group registered with the Department of Cooperatives and has received trainings in maize and livestock production. The group is currently involved in maize, soybean and onion production and requires support of agro-inputs such as improved seeds and fertilizers. The major source of funding is dues from members. In Binduri, *ASUGA* another CBO was established in 1996 and support each other to access farm inputs. This unregistered group comprises 18 members (11 males and 7 females) who meet every two weeks. The group is involved in maize, millet, sorghum, onion, soybean and okra production, etc. They received trainings in compost making and use of improved seeds. The group requires support in improved crop and livestock production practices. These are few among the many CBOs that exist in the region that the project can work with, and strengthen their capacities.